KUDZU

A FORAGE CROP FOR THE SOUTHEAST

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What Kudzu Is and What It Is Good For

KUDZU [2] is a perennial leguminous vine native to Japan. It has large leaves, somewhat like those of a bean but larger, and sometimes each leaflet is coarsely lobed. The stems are coarse and long and become woody in regions where they are not killed to the ground by frost. The flowers are deep purple and borne in clusters. Plants set seed sparingly in the United States. The leaves and young stems are very sensitive to frost, the older stems less so, and the roots survive the winter in favorable situations in the Northeastern States, where the plant is often used as an ornamental climber. In the North the stems are killed by cold; and new growth comes from the root each year. In parts of the South, such as southern Georgia, only the leaves and young shoots are killed, and consequently the main stems may attain considerable size.

Kudzu is valuable as a forage crop. It may be grazed or cut for hay, but in either case it must be handled with a certain degree of care if good results are to be obtained over a long period. It can be overgrazed, or it can be cut so often that the stand is reduced until the field is no longer profitable. This fact has often been overlooked in the past and has been the cause of a great deal of disappointment in the crop. While there are no figures available as to the acreage of kudzu, it is estimated that there are about 100,000 acres.

Habit and Soil Preference

The kudzu root sends out several shoots (fig. 1), their number depending upon its age and vigor. These shoots trail on the ground or climb any available support. They have been known to grow 70 feet in a season. Since kudzu is a hot-weather plant, its growth is delayed until the ground warms up and stops with the first frost. More growth is made, therefore, in the South than in the North and more on warm soils than on cold. Stems that lie on the ground root at the joints (if the soil is moist and the contact good), and thus new plants are established (fig. 2). When a field is well set with plants in this way and growth is thick, new, erect, twining stems grow out from the main runners, and the mass of stems and leaves may reach a depth of 2 to 4 feet. When the plants are cut new shoots are put out.

[1] Revised by Roland McKee, senior agronomist.
[2] *Pueraria thunbergiana*.

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Kudzu will grow on many soil types and can thrive on soils too acid for alfalfa or clover. This is one of its great advantages. It appears to do best on a good clay loam but makes good growth on sandy soils, except pure sands, on which, while it will make some growth, it does not do well enough to be profitable. It also fails to do well on certain heavy soils, such as the black prairie of Mississippi, and on soils with a high water table. Soils a few inches deep, underlaid with rock or hardpan, are also unsuitable for kudzu. As with nearly all plants, the better the soil the better the growth.

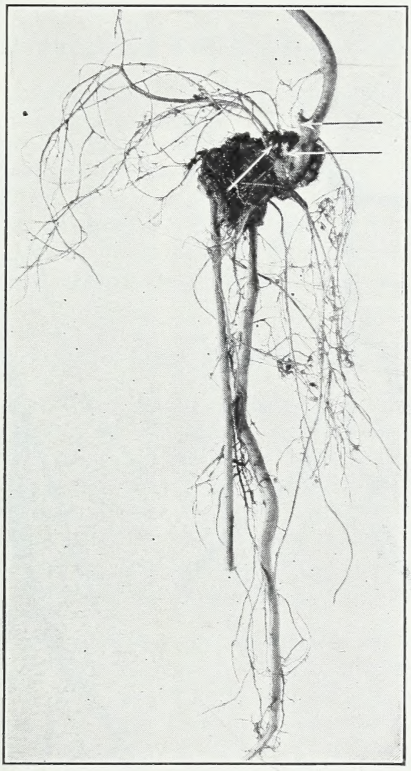

FIGURE 1.—Root showing buds for the next season.

Spacing and Number of Plants Required

The best way to establish a field of kudzu is to set out rooted plants 2 years old or more. This is a relatively expensive process and makes the cost of setting out a large acreage at one time practically prohibitive. If quick results are wanted the plants may be set 3½ by 3½ feet. With this spacing no other crop can be grown on the land during the season of setting. If roots are spaced 3½ by 7 feet, one row of some cultivated crop can be grown between two rows of kudzu the first season. This plan will help to pay the cost of the cultivation necessary to keep down the weeds. In some cases even wider spacings are made.

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One grower in southern Georgia grows three rows of corn between two of kudzu the first season, and two the next season.

A spacing of 3½ by 7 feet requires 1,800 plants to the acre. The cost of roots varies with their age and size, and growers do not always charge the same price for roots of the same age. A minimum cost for 2-year-old roots is about $10 a thousand, making the cost of roots $18 an acre for a 3½-by-7-foot planting.

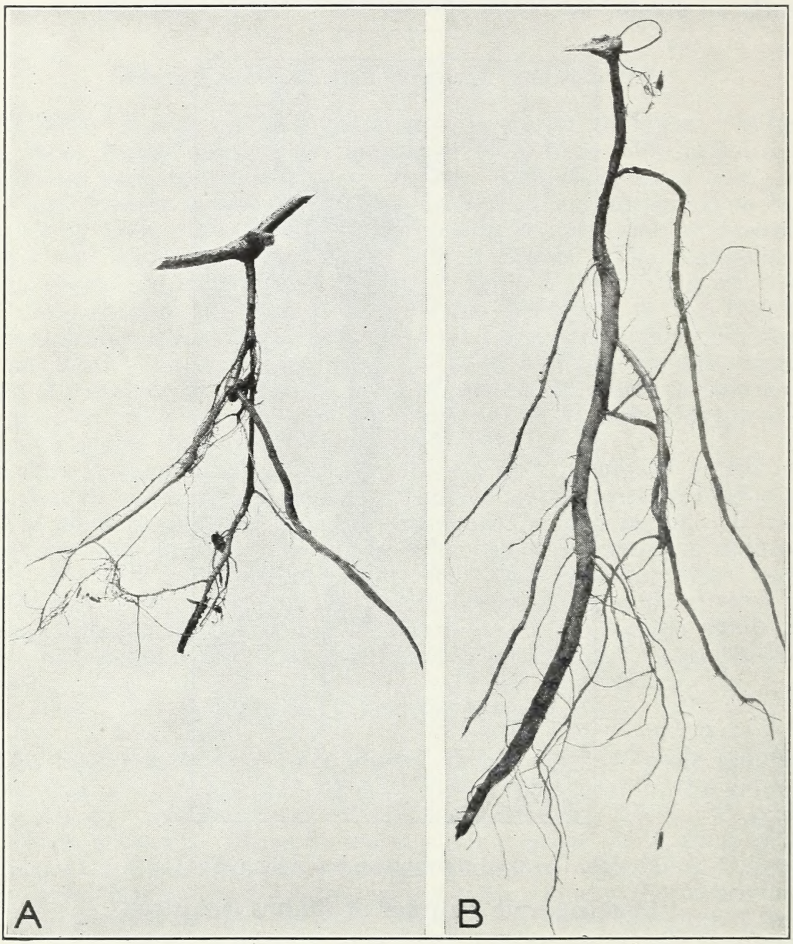

FIGURE 2.—*A*, One season's root from a runner; *B*, 2-year-old root.

Setting the Plants

Plants may be set in furrows opened with a plow or in holes made with a posthole digger or a spade. If the plants are set in furrows, the furrows should be deep enough for the roots to be placed upright, or nearly so, with the "eyes" about 1 inch below the surface, although some growers set the plants so that the eyes are at or just above the surface. Care in planting will pay. Kudzu roots must be dug and set

before new growth begins; therefore the time for setting will vary with the latitude. It is best to set the roots soon after digging them, and on no account should they be allowed to dry. In the South the roots may be set in February; in the North as early in spring as the ground can be made ready. If roots are bought in the extreme South for setting in the North they must be kept in cold storage for a time, but this is not desirable. Wherever possible it is best to plant roots as soon as they are received and to procure roots as near home as possible, and get well-rooted, good-quality stocks. Artificial inoculation is seldom if ever needed, as the plants seem to become inoculated naturally everywhere.

Establishing Kudzu From Seed

Kudzu may be established from seed by planting directly in the field, but such procedure is seldom to be recommended. Under ordinary field conditions the germination of the seed usually is poor, the seedlings are feeble, and poor stands result. If seed is used, it should be sown thickly, about 15 pounds to the acre in a seedbed, and the seedlings allowed to grow for 2 years and then set out. Cuttings with two or three nodes or joints may be treated in the same way, being set in good, moist soil, where they will take root and establish plants to be moved later.

Important Points About Planting

At one extreme is this method of planting: Using cheap, rooted cuttings, dropping them 10 feet apart in furrows 10 feet apart, and covering them with a plow. This is the least expensive method and the surest to disappoint; failure is almost certain. At the other extreme is this method: Using 2- to 3-year-old well-rooted plants, setting them carefully as soon as they are received, on moist, well-prepared land, 3½ by 3½ feet apart. This is the most expensive method, but if it is followed hardly a plant will die, and the field can be used the second year.

The grower can choose between these two extremes. He should remember, however, that (1) the closer the planting and the better the roots the quicker the results; (2) widely spaced plants must be cultivated 1 or 2 years to give the vines a chance to root at the nodes or peg down; (3) roots must not be allowed to dry out; (4) roots must be dug and set before growth starts; (5) roots must be set carefully, as deep as the length of the root and with crown buds or eyes at or about 1 inch below the surface.

Cultivation

The plants must be cultivated for the first year or two in order that weeds may not interfere with the establishment of new plants from the first runners. It must be remembered that before a field of kudzu is useful for forage there must be many more rooted plants per acre than have been set. The Georgia College of Agriculture places the required number of plants at three or four for every square yard of surface. This large number of plants must come from the rooted joints, and the joints cannot root unless they lie on moist ground. Weeds interfere

with this, as the vines climb over them. Even when plants are spaced 3½ by 3½ feet, some cultivation is advisable the first season. With wider spacing such culture is imperative if a good hay stand is to be had.

How to Use Kudzu

When once well-established, a field of kudzu may be used many years for hay or pasture, provided it is used right. Probably because of some of the early enthusiasm and advertising, a notion that well-established kudzu is indestructible has taken root. This is far from being the case. Alfalfa is less easily killed by abuse than is kudzu. The Alabama Agricultural Experiment Station (Circular 57) has shown that kudzu makes new growth after cuttings at the expense of the reserve material in the root. If cuttings are made frequently in a season, the root may actually be smaller at the end of the season than at the beginning. In such cases the growth the next year is feeble, and if the field is exposed to severe winter weather the plants probably will die because of lack of reserve material. In the Alabama experiment the average yield for 3 years was greatest on the plot cut twice (June 1 and October 15), and much less on plots cut four and five times, and the stand on the heavily cut plots was thinned. Plots cut June 1 and August 15 suffered a greater decline in yield than those cut June 1 and October 15, which seems to show that after the August cutting the roots made new growth at the expense of the reserve material and were thus weakened.

Yields and Quality of Hay

In the Alabama experiments referred to above, the best average yield for 3 years was 2 tons per acre, the best yields being obtained the first year, when on one plot 5,749 pounds per acre was cut. The Georgia College of Agriculture reports yields of 1 to 4 tons per acre. From available data it seems probable that a yield of 2 tons may be considered good, while in most cases yields of 2 to 3 tons are more likely to be secured.

Kudzu makes very good hay. Analyses show a protein content equal to that of alfalfa or better. It cures readily and well, its leaves do not fall in curing, and the hay is readily eaten by all kinds of livestock. There is no doubt that kudzu makes hay equal to any other.

Cutting

Kudzu should not be cut until the ground is well covered with growth and many vines have rooted. This may be the second or third year after the roots are set out, or even longer, depending on the number of plants originally set, the care given, and the season. When ready to cut, the mass appears to be a tangle of vines that seem difficult to handle. While the first cutting is less easy than later ones, there is no great difficulty about it. A mower with divider attachments will cut kudzu satisfactorily. The cut material does not fall in a smooth swath as alfalfa does when cut, but it can be readily raked if the rake teeth are not allowed to drag the ground. When the growth is very heavy, it is sometimes forked rather than raked. Kudzu cures quickly, and under favorable conditions it can be cut in the morning and brought into the barn the same day.

One advantage of kudzu is that cutting need not be done at any special time. The Alabama experiments indicate that two cuttings give better results than three or more, and that in the South these cuttings should be made in June and October. For each cutting, however, there is considerable margin of time, and the cutting can be made when other work is slack or the weather most favorable.

Grazing

Kudzu makes good grazing, but it must be handled with care, as it can be easily overgrazed, to the injury of the stand. Fields have been badly thinned by heavy grazing, and in such a case a year's rest is necessary for the plants to recover. In experimental work good gains have been made by cattle grazing kudzu, and it is recognized as having high nutritive value. Since kudzu withstands drought well, it has been suggested that the kudzu area be reserved for late summer

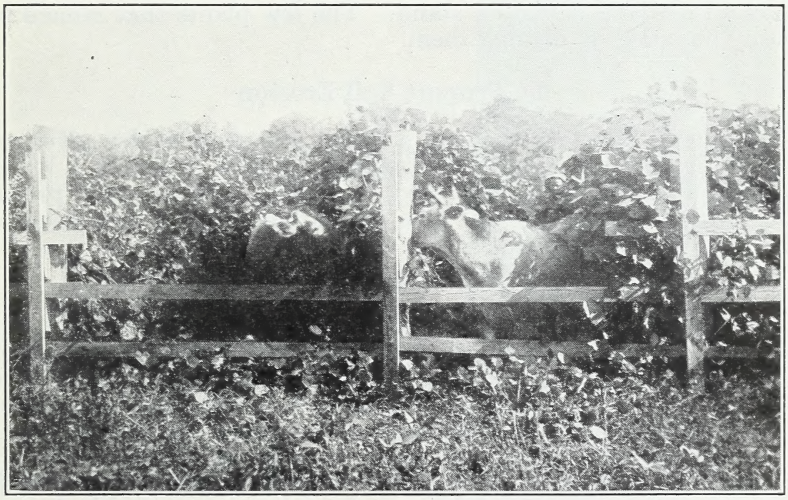

FIGURE 3.—Cows grazing on kudzu growing on trellises.

or fall grazing when grass pastures are poor. Rotation grazing has also been recommended. Whatever the practice, it should be borne in mind that kudzu makes its new growth largely at the expense of food reserves in the roots. If the plant is so closely grazed that adequate reserves cannot be stored, the plants are weakened and may die.

In a few cases supports have been erected in kudzu fields (fig. 3). The vines climb up these supports, and cattle feed on the climbing vines. Naturally the area of kudzu exposed to the cattle can be considerably increased by this method, and loss and damage by trampling are minimized.

As a Soil-Improving and Cover Crop

When turned under, kudzu will increase the yields of following crops, but there are few records by which this effect may be measured.

The Alabama station reports heavy increases in sorghum hay, corn, and oats for 10 years after a crop of kudzu was turned under. In this case the kudzu appears to have occupied the ground for three seasons with nothing removed. There are no published data to show what would be the effect of turning kudzu under after grazing or harvesting in the usual course, but there is no reason to doubt that increases in the yields of cultivated crops would follow. Kudzu is used as a cover crop in pecan groves in some cases in northern Florida and in southern Georgia, with good results, though it is necessary to use sheets when harvesting the pecans.

Kudzu Not a Pest

There is no danger that kudzu will become a pest. True, the growth, if uncontrolled, will make a tangle of vines likely to smother bushes and even small trees, but in fields heavy grazing or cutting at once reduces the stand and weakens the growth. Hogs will eat the starchy roots and destroy a stand. The few plants that remain can readily be killed by digging them.

To Prevent Soil Erosion

In gullies and on steep slopes a heavy growth of kudzu gives substantial protection against soil erosion. In such situations a limited amount of grazing can be allowed, and kudzu will not only prevent further erosion but also will give the farmer some return from the land.

The Place of Kudzu

Where alfalfa, clover, or lespedeza can be grown profitably there is no place for kudzu as a general farm crop. Any of these crops under favorable conditions will yield as much as kudzu or more. Where, because of unsuitable soils or lack of moisture, these crops cannot be produced profitably, kudzu often is a good substitute.

In the northern part of its range, that is, about the latitude of Washington, D. C., its most profitable place would seem to be on steep slopes and on rocky fields or other places not suitable for general cultivation. Farther south, especially where rainfall is often deficient, it may become one of the most profitable forage crops. For controlling gullies and badly eroded farm lands in the South, kudzu is to be recommended.

Any farmer in the South or Southeast may advantageously plant a small area to be expanded if the crop proves profitable to him. Kudzu would appear to have a place on submarginal lands, especially if a farmer, having a small area established, can dig his own roots and extend his plantings at a minimum expense for roots.

In the Northern States and in Kentucky and Tennessee kudzu has never been successful as a field crop. Possibly one reason is that, while the old roots may live, the rooted joints of each season are winter-killed, and the establishment of a thick stand is thus prevented.

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